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Inventor Vincent J. Vendetti
 Michael M. Canaday

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5 **DUAL ADJUSTING OVERRIDE PRECISION SWITCH ACTIVATOR**

ORIGIN OF THE INVENTION

10 The invention described herein was made in the performance of
official duties by an employee of the Department of the Navy and
may be manufactured, used, licensed by or for the Government for
any governmental purposes without the payment of any royalty
thereon or therefor.

15 1.0 Field of the Invention

 The present invention relates generally to firearm technology
and, more particularly, to an assembly for controlling the
triggering action of a firearm, such as rocket launchers.

20 2.0 Background of the Invention

 Triggering mechanisms for firearms, such as a rocket launcher,
are well known, and need to provide precision activation, while at
the same time provide repeatable and reliable operation. One of
25 the parameters of a triggering mechanism that needs to be taken
into account is the amount of travel that the trigger encounters
during its usage in activating the firearm. For firearms, such as
a rocket launcher, it is desirable that the amount of travel be
limited to 0.4 or less inches of linear travel.

5 Triggering mechanisms for firearms, such as a rocket launcher,
typically activate a depressible switch, which, in turn, activates
the associated elements for the initiation and, then, completion of
the firing of the rocket from the associated launcher. A
triggering mechanism that experiences overshoot, may damage the
10 depressible switch which, in turn, may negate the operational
readiness of the associated firearm. It is desired that means be
provided for a triggering mechanism that prevents the damage
commonly caused by overshoot of the trigger mechanism.

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SUMMARY OF THE INVENTION

Accordingly, it is a primary object of the present invention
to provide for a triggering mechanism in which the movement of the
20 trigger is limited to 0.4" of linear travel and is adjustable to
within an accuracy of about 0.01".

It is a further object of the present invention to provide
means that prevents any damage to a depressible switch that may
25 occur from the over-travelling of an associated trigger switch.

In accordance with these and other objects, the invention
provides an assembly interconnected to a trigger mechanism of a
firearm that controls the triggering action thereof. The assembly
30 comprises a housing, a sliding actuator, first and second yielding

5 means, a rod, a block mated to the housing, and a depressible switch. The sliding actuator has an interior and is lodged in the housing and has first and second ends with an extension extending outward from the first end. The first yielding means has a first predetermined stiffness and is lodged in the housing and located
10 around the first end of the sliding actuator. The second yielding means has a second predetermined stiffness which is less than the first stiffness and is lodged in the housing and located around the second end of the sliding actuator. The rod has at least first and second sections having respective diameters to pass through the
15 interior of the sliding actuator and to come in contact with the first yielding means. The block is located adjacent the extension of the sliding actuator, whereas the depressible switch is located on the block and in alignment with the extension of the sliding actuator.

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BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing objects and advantages of the present invention
25 will become more fully understood from the following detailed description and reference to the appended drawings wherein:

Fig. 1 is an overall view of the trigger mechanism of the present invention shown mounted on a typical rocket launcher
30 assembly.

5 Fig. 2 illustrates the assembly of the present invention for
a trigger mechanism and is partially cut-away so as to more clearly
show the arrangement of the associated elements thereof.

10 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings, wherein the same reference number
indicates the same element throughout, there is shown in Fig. 1 an
overall view of a typical launcher/spotter rifle assembly
15 designated generally by the reference number 10. The rocket
launcher/spotter rifle assembly 10 has a handle 12 that is used to
operate a trigger 14 whose triggering action is controlled by the
assembly 100 (shown in phantom) of the present invention which may
be further described with reference to Fig. 2.

20 The assembly 100 comprises a housing 102 and a switch
activator 104. The switch activator 104 is lodged in the housing
102 and has first and second ends 106 and 108 with an extension 110
extending outward from the first end 108. The switch activator 104
25 also has an interior 112 that completely extends therethrough.

The assembly 100 further comprises first and second yielding
means 114 and 116 respectively located adjacent the first end 106
and the second end 108. The first yielding means 114 has a first
30 predetermined stiffness and the second yielding means 116 has a

5 second predetermined stiffness which is less than the first stiffness. The spring constant for yielding means 116 may be approximately 15 lb/in. The spring constant of yielding means 114 may be approximately 100 lb/in.

10 The assembly 100 further comprises a rod 118 having at least first and second sections 120 and 122 with the first section 120 having a diameter that allows it to pass through the interior 112 of the sliding actuator 104. The second section 122 has a leading edge 122A that comes into contact with the first yielding means
15 114. The second section 122 of rod 118 enters and snugly occupies an opening 124 of the housing 102.

The assembly 100 further comprises a block 126 mated to the housing 102 by appropriate means. Screws 128 and 130 hold switch
20 132 to block 126. Block 126 is mated to housing 102 by the geometry of the block and housing (ie: keys and keyways cut into parts) and screw 140. The block 126 has attached thereto by appropriate means (not shown) a depressible switch assembly 132 which may have an arm 134 that is located in alignment with the
25 extension 110 of the sliding actuator 104.

The block 126 is preferably slidably adjusted by adjustment means 136 shown in the upper portion of block 126 as viewed in Fig. 2. The adjustment means 136 comprises a threaded opening 138 of
30 the block 126 and a screw 140 having a head 142 and threads 140A

5 which are complementary to the internal threads on the opening 138
of the block 126. The head 142 preferably has a groove 144 into
which is lodged a spring pin 146.

10 The housing 102 has a hollow comprising a sequentially
arranged first, second and third compartments that respectively
provide for the lodging therein of the first yielding means 114,
first and second ends 106 and 108 of the switch actuator 104 as
well as the extension 110 of the slidable actuator 104, and the
second yielding means 116. The third compartment that lodges the
15 second yielding means 118 further comprises an opening in the third
compartment and which is dimensioned to accept a set screw 148
which, in turn, is dimensioned to pass through the predetermined
opening of the second yielding means 116. The set screw 148 is
adjustable by an opening (not shown) in the block 102 so as to come
20 into contact with the second end 108 of the switch actuator 104.
The set screw serves as a stop for the sliding actuator 104. The
set screw 148 comes into contact with the second end 108 of the
sliding actuator 104.

25 The first and second yielding means 114 and 116 are
dimensioned so as to respectively operate within the first and
second compartments of the housing 102. The first yielding means
114 has a predetermined opening that is sufficient to accept the

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5 first section 120 of the rod 118, whereas the second yielding means 116 has a second predetermined opening that is sufficient to accept the set screw 148.

10 The switch actuator 104 is dimensioned so that its first and second ends 106 and 108 completely occupy the second compartment of housing 102. The interior 112 of the sliding actuator 104 has a linear length which is sufficient to accept the complete length of the section 120 of the rod 118 when the first yielding means 114 is in its completely compressed state.

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The rod 118 is selected so that its first section 120 has a diameter which is dimensioned so as to pass through the predetermined opening of the first yielding means 114. The second section 122 of rod 118 is dimensioned, in particular, to have a leading edge 122A that engages the first yielding means 114. The rod 118 preferably has a third section 150 that has a diameter similar to that of the first section 120 and has a length sufficient to interconnect to a cam which is tied to the launcher trigger mechanism 14 of Fig. 1.

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Operation of the Switch Assembly

With reference to Fig. 2, in operation, the rod 118 is pushed in the direction 152 by way of the cam movement of the launcher trigger 14. The movement of the rod 118 in direction 152 causes the leading edge 122A to intercept the first yielding means 114

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5 which, in turn, pushes against the first end 106 of the sliding activator 104 causing the first end 106 and the second end 108 to move in a direction 154, while also causing the extension 110 to move in a direction 156 shown in Fig. 2.

10 The switch activator 104 and the rod 118 move in unision due to the high stiffness of the first yielding means 114 which serves as an override spring. The switch activator 104, in particular, its extension 110 intercepts the arm 134 of the switch assembly 132 which, in turn, causes the triggering action of the switch assembly
15 132. After such triggering action, the second end 108 of the switch activator 104 intercepts the set screw 148 which prevents the switch activator 104, in particular, its outward extension from crushing the switch 132. The rod 118 however, is allowed to continue moving through the interior 112 of the switch activator
20 104 and it compresses the second yielding means 114. Screw 148 prevents end 108 from compressing 116, but only after switch has been activated. When the launcher trigger 14 is released, the switch activator 104, the first yielding means 114 serving as an override spring, and the switch rod 118 are returned to their
25 original home positions by the resiliency of the second yielding means 116 serving as a recoil spring.

 The switch assembly 132 can be adjusted to trigger within a range of about 0.4" within an accuracy of about 0.01 inches of
30 horizontal travel by means of the adjustment screw 140 and the set

5 screw 148. The adjustment screw 140 preferably fits through a hole
158 in the block 126 and is threaded into the opening 138 of the
block 126. The pin 146 captures the adjustment screw 142 while
allowing the adjustment screw 142 to turn about its axis which, in
turn, allows the switch assembly 132 carried by the block 126 to be
10 moved back and forth until the switch assembly 132 is properly
adjusted in position relative to extension 110 and within a range
of .012 - .04 for the separation between the switch activator 104
and the arm 134 of the switch assembly 132. The set screw 148 is
adjusted such that the switch tab 104 moves only enough to trigger
15 the switch assembly 132.

It should now be appreciated that the practice of the present
invention provides for a switch assembly that allows for an
adjustable linear travel of its associated trigger mechanism of
20 about 0.4" and such adjustment is within an accuracy of about 0.01
inches. Further, it should be appreciated that the practice of the
present invention prevents any damage to the switch assembly of the
launcher mechanism from any over-travel of the trigger mechanism.

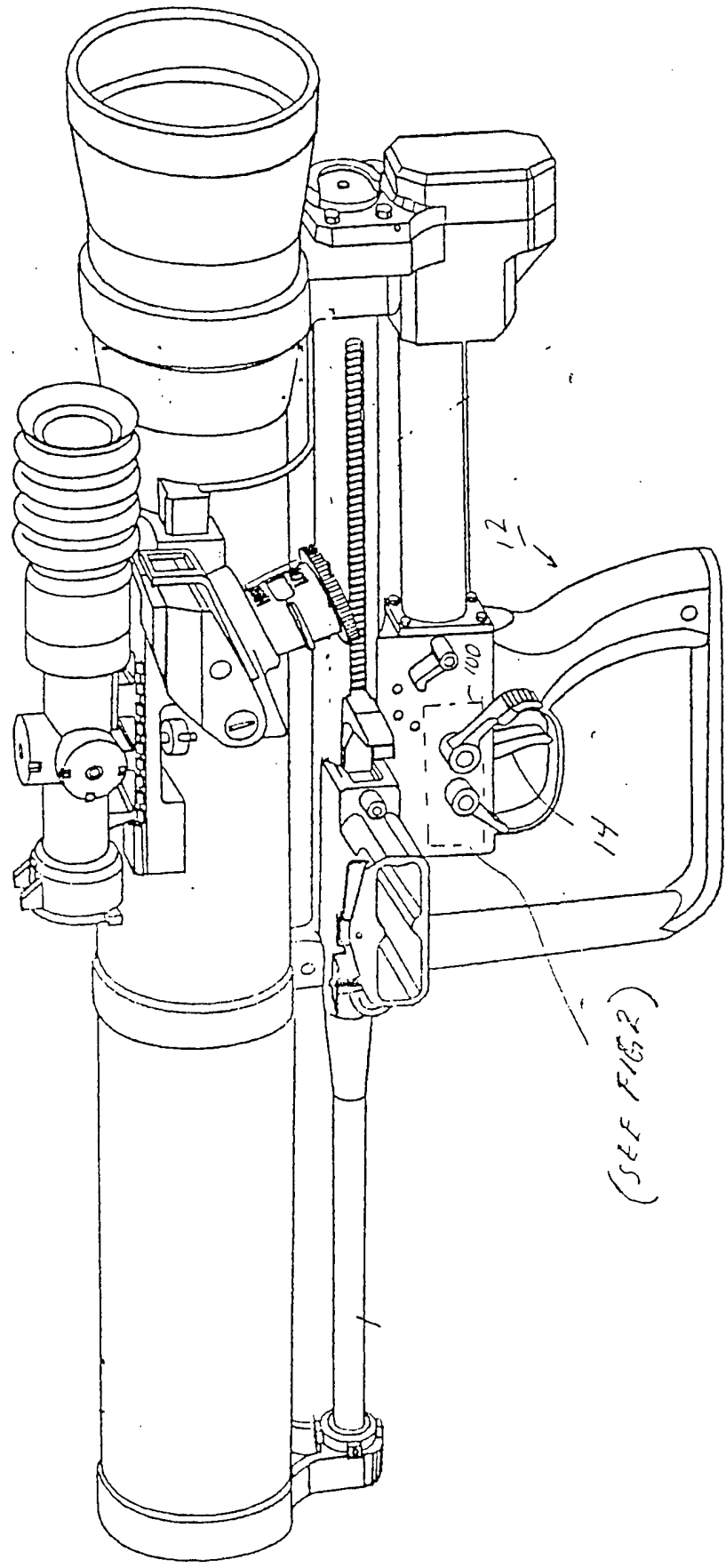
Although the invention has been described relative to a
specific embodiments thereof, there are numerous variations and
modifications that will be readily apparent to those skilled in the
art in light of the above teachings. It is, therefore, to be
understood that the
invention may be practiced other than as specifically described.

ABSTRACT OF THE DISCLOSURE

A switching assembly that operatively cooperates with the triggering mechanism of a firearm, such as a rocket launcher, is disclosed. The switching assembly allows for an adjustable trigger linear travel of about 0.4" within an accuracy of 0.01 inches, while at the same time prevents any over-travel of the switch activator from damaging a depressible switch that is operatively interconnected to firing of the rocket from the launcher.

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INVENTOR: VINCENT J VENTURINI

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(SEE FIG 2)

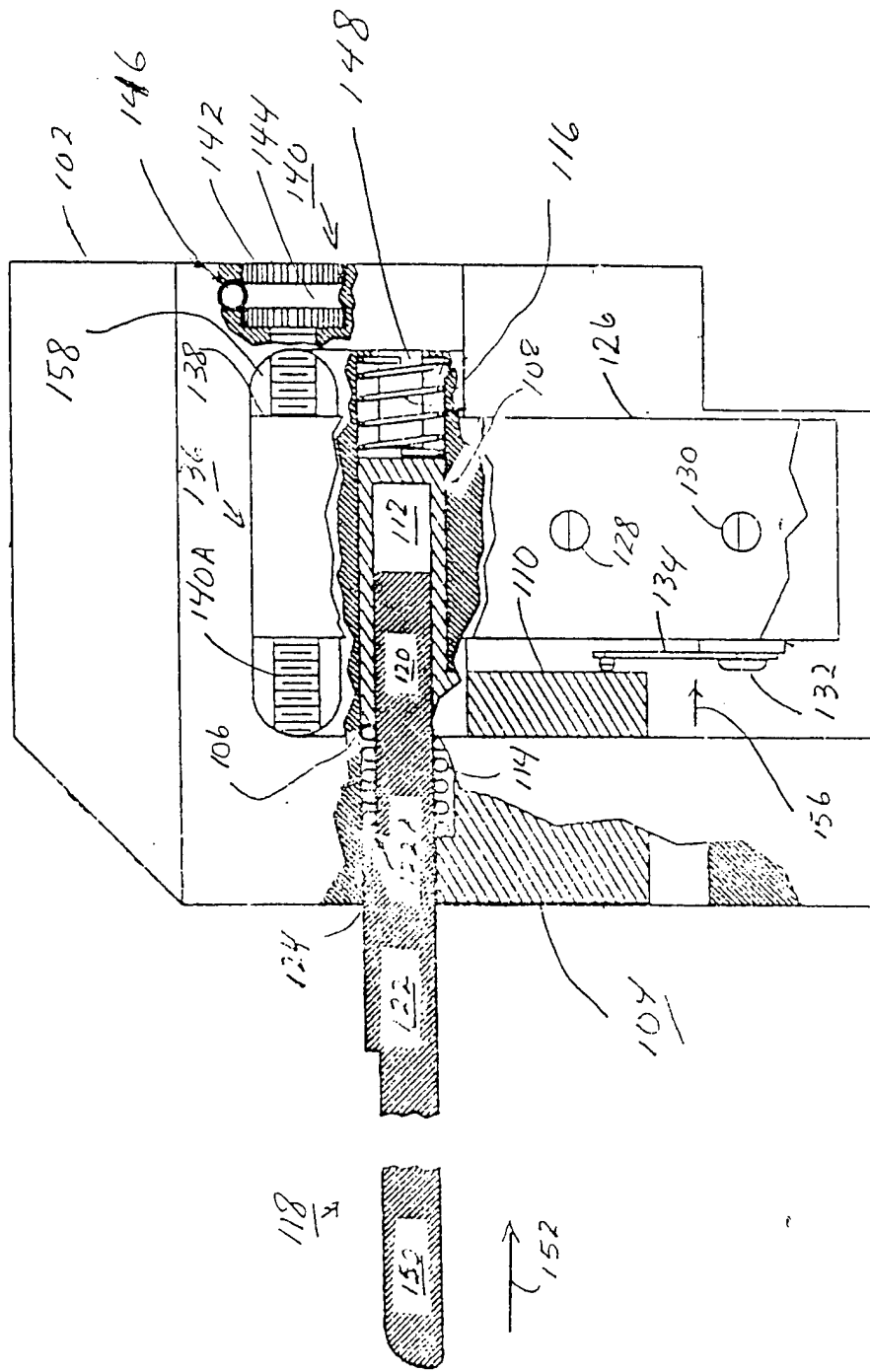
FIG 1

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INVENTOR: VINCENT J. ROLEMAN

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